Midwest Technology Assistance Center
Groundwater Resource Assessment for Small Communities

Groundwater Availability at Teutopolis, Illinois

(Effingham County)

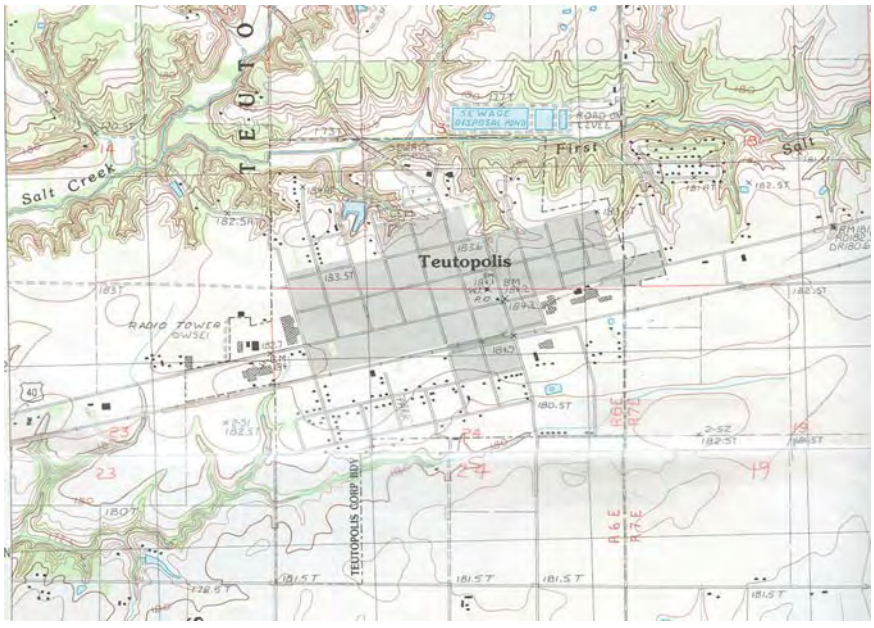
Project Overview

This project is an outgrowth of the Public Service Program of the Center for Groundwater Science (CGS) at the Illinois State Water Survey. For over 50 years, the CGS has provided groundwater information to any requesting individual, commercial facility or public water facility. Groundwater resource assessments have been an integral part of this public service and have been undertaken for thousands of individuals and facilities throughout its history. Community groundwater supplies that have been identified as potentially "deficient" are the targets for this project. The criterion used for determining community deficiency were; 1) Water Supply and Demand (operating time), 2) Aquifer Limitation, 3) Well Specific Capacity, and 4) Facility History. The Village of Teutopolis has been identified as a target community for groundwater assessment through this project.

Project Goal

To provide a resource tool of pertinent groundwater information to each target facility. This document describes a summary of historic information, current conditions and the potential for expansion of the water supply within 5 and 10 miles of Teutopolis.

Teutopolis (Effingham County)



The Village of Teutopolis, Effingham County, currently obtains groundwater from three community supply wells (Well #1, Well #2(TW 2-55) and Well #3(TH 8-72)). The wells supplied an average of 75,800 gallons of water per day during 2005 to the Villages' 1600 residents with an additional 400 residents outside the corporate limits. The Village also purchased 32,760,500 gallons from the City of Effingham, Lake Sara. The wells range in depth from 30 to 74 feet and pump between 37 to 117 gallons per minute. The project criterion ranked Teutopolis as "deficient" mainly due to its shallow water table wells, moderate specific capacities and one of the wells long pumping period.

Historic Information

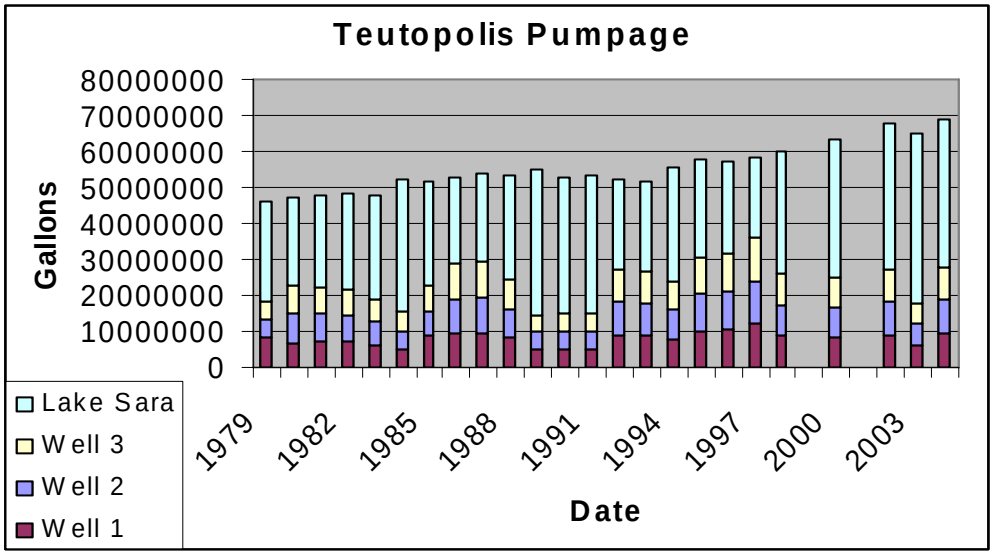
Background Well Information

Well No.1
Finished in shallow sand and gravel deposits located southeast of the village in Section 24, T.8N., R.6E., Effingham County. The well was drilled to a depth of 74 feet in 1941 and, upon completion, reportedly produced 65 gallons per minute (gpm) for 2 hours with 29 feet of drawdown. Calculated specific capacity from this test was 2.27 gpm/ft. Static water level was reported as 17.5 feet below land surface.

Well No.2
Finished in shallow sand and gravel deposits located to the northeast of the village along Route 40 in Section 16, T.8N., R.7E., Effingham County. The well was drilled to a depth of 30 feet in 1955 and, upon completion, reportedly produced 100 gpm for 48 hours with 7.6 feet of drawdown. Calculated specific capacity from this test was 13.2 gpm/ft. Static water level was reported as 6.5 feet below land surface.

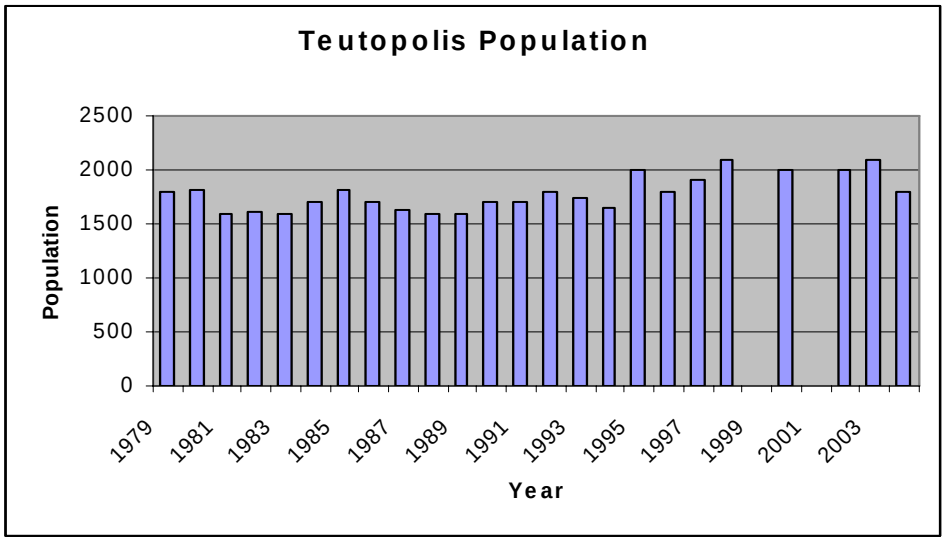
Well No.3
Finished in shallow sand and gravel deposits located approximately one-half mile east of Well No.2 along Route 40 in Section 16, T.8N., R.7E., Effingham County. The well was drilled to a depth of 39 feet in 1972 and, upon completion, reportedly produced 60 gpm for 3 hours with 7 feet of drawdown. Calculated specific capacity from this test was 8.6 gpm/ft. Static water level was reported as 23 feet below land surface.

Background Pumpage Information



Source: ISWS Illinois Water Inventory Program

Historic Population Information



Source: ISWS Illinois Water Inventory Program

Regional Information

Resources within 5 miles of Teutopolis (Figure 1).

Domestic Groundwater Supplies
The available regional data indicate that groundwater for domestic and farm use in this part of Illinois is obtained from mainly large-diameter (approximately 3 feet) bored wells finished in the unconsolidated materials above bedrock. These wells tap stringers or lenses of silt, sand, or gravel only a few inches thick contained in the unconsolidated materials above bedrock. They range in depth from about 30 to 60 feet. The yield of this type of well is limited to a few hundred gallons per day and may be only barely adequate for normal household uses.

A few reported wells in the area have been drilled into the underlying Pennsylvanian bedrock formations. These wells are finished in thin sandstone and creviced limestone beds in the shallow bedrock and range in depth from about 125 to 270 feet. Upon completion, these wells were pumped at very low rates for short periods of time.

Municipal Groundwater Supplies
There are two towns within five miles of Teutopolis; the City of Effingham located to the west and the Village of Dieterich located to the south. Effingham provides water to its residents from Lake Sara, located to the northwest of town. The Village of Dieterich operates a municipal groundwater supply and uses five wells located in Sections 14, 22, and 23, T.7N., R.7E., Effingham County. The wells are finished at depths ranging from 24 to 34 feet below land surface and tap sand and gravel deposits associated with Dieterich Creek. The wells reportedly pump around 11 gpm each for a total of 55 gpm for the towns' water needs. The village is also connected to the EJ Water Corporation because of past shortages from their well field during dry climatic conditions. EJ Water Corporation also provides water to several other communities in this area.

Resources with 10 miles of Teutopolis (Figure 2).

Municipal Groundwater Supplies
Towns within 5 to 10 miles of Teutopolis include:
Elliottstown, Funkhouser, Montrose, and Watson in Effingham County; Woodbury in Cumberland County; Island Grove in Jasper County; and Sigel in Shelby County.

The Villages of Montrose, Watson, and Sigel all maintain (or have maintained) wells for a municipal supply in the Teutopolis area. Montrose uses two wells located within two miles of the current Teutopolis wells in Sections 10 and 11, T.8N., R.7E., Effingham County. These wells tap sand and gravel deposits located along Route 40 which may be connected to the sands that Teutopolis

currently uses for its supply. Watson, located to the southwest of Teutopolis had used five wells located in Section 29, T.7N., R.6E., Effingham County. Their wells ranged from 28 to 65 feet in depth and were finished in sand and gravel deposits associated with the northern edge of the Little Wabash Buried Bedrock Valley. However, since 1993, the village has been supplied by the EJ Water Corporation. Sigel, located to the north of Teutopolis, uses four wells located in Sections 13 and 14 of T.9N., R.6E, Shelby county. These wells are finished at depths ranging from 52 to 65 feet and tap sand and gravel deposits found locally in and around the village.

All the remaining small towns located in the study area purchase their water from Effingham or EJ Water Corporation. Some may have private wells for the residents' needs.

Figures 3 and 4 picture the ISWS Potential Yield maps for sand and gravel and bedrock aquifer in Illinois, respectively. The pertinent counties for Teutopolis are highlighted. Figure 3 indicates that sand and gravel deposits are variable throughout most of the Teutopolis area and no major deposits are indicated. The bedrock map (Figure 4) indicates poor availability of groundwater from the bedrock throughout the Teutopolis area. Figures 5 and 6 present the probability of occurrence of the sand and gravel and the water-yielding character of the shallow bedrock for the Teutopolis area as depicted in the Illinois State Geologic Survey Circular 225, *Groundwater Geology in South-Central Illinois* (Selkregg, et al., 1957). Figure 5 indicates "Fair to Good," variable and discontinuous sand and gravel deposits and Figure 6 indicates only small supplies are available from the shallow bedrock units. The domestic well construction records verify these map outlooks.

Figure 1. 5-mile radius map- Teutopolis

Figure 2. 10-mile radius map- Teutopolis

Groundwater Availability Summary

Reported information indicates that the sand and gravel deposits the Village uses has provided as little as 30 percent and as much as 60 percent of their water requirements over the last 27 years. The wells appear capable of providing this percentage but recent years have shown an increase in purchased water from Effingham. The most likely reason for this may be population and/or business growth. The available regional groundwater information indicate that an expansion of this supply would be very difficult and perhaps too costly. The sand and gravel deposits that are currently being used are variable in this area and testing has shown them to be limited in their extent and thickness. Moving further east would impact the Village of Montrose well field, in fact, our records indicate that Well No.3 may have belonged to Montrose when constructed. Other groundwater resource information also indicate variable sand and gravel deposits throughout this area. Locating and developing a new well field would, most likely be too costly because of this variability. The most logical approach to increasing the Village supply would be to purchase more water through the City of Effingham.

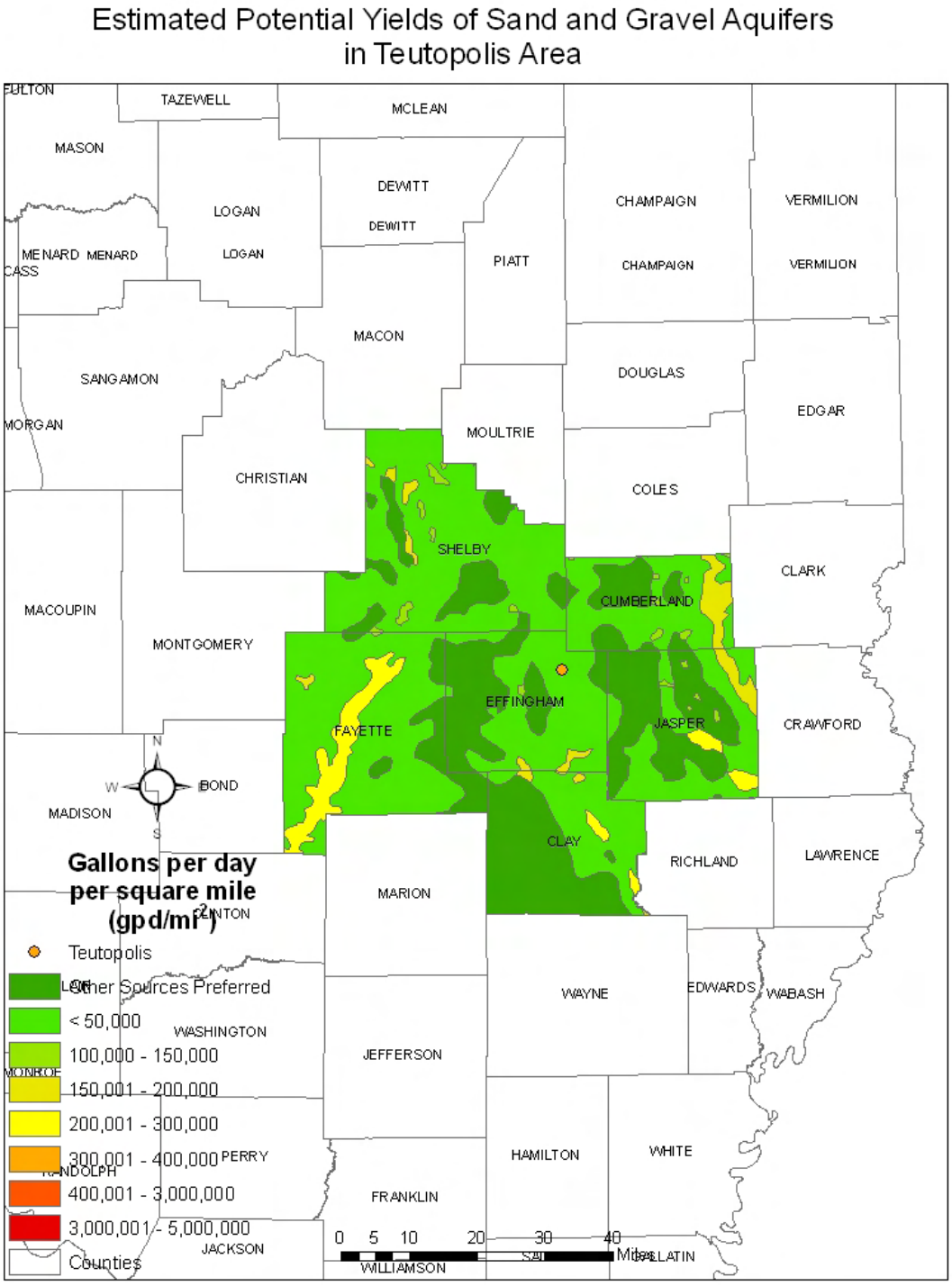

Estimated Potential Yields of Sand and Gravel Aquifers
in Teutopolis Area
TAZEWELL
MCLEAN
MASON
DEWITT
LOGAN
CHAMPAIGN
VERMILION
MENARD
PIATT
MACON
SANGAMON
DOUGLAS
EDGAR
MORGAN
MOULTRIE
CHRISTIAN
COLES
SHELBY
CLARK
CUMBERLAND
MACOUPIN
MONTGOMERY
EFFINGHAM
FAYETTE
JASPER
CRAWFORD
BOND
MADISON
CLAY
RICHLAND
LAWRENCE
MARION
WAYNE
EDWARDS
WABASH
WASHINGTON
JEFFERSON
HAMILTON
WHITE
FRANKLIN
PERRY
JACKSON
WILLIAMSON
Gallons per day
per square mile
(gpd/mi²)
Teutopolis
Other Sources Preferred
< 50,000
100,000 - 150,000
150,001 - 200,000
200,001 - 300,000
300,001 - 400,000
400,001 - 3,000,000
3,000,001 - 5,000,000
Counties
0 5 10 20 30 40
Miles

Figure 3.

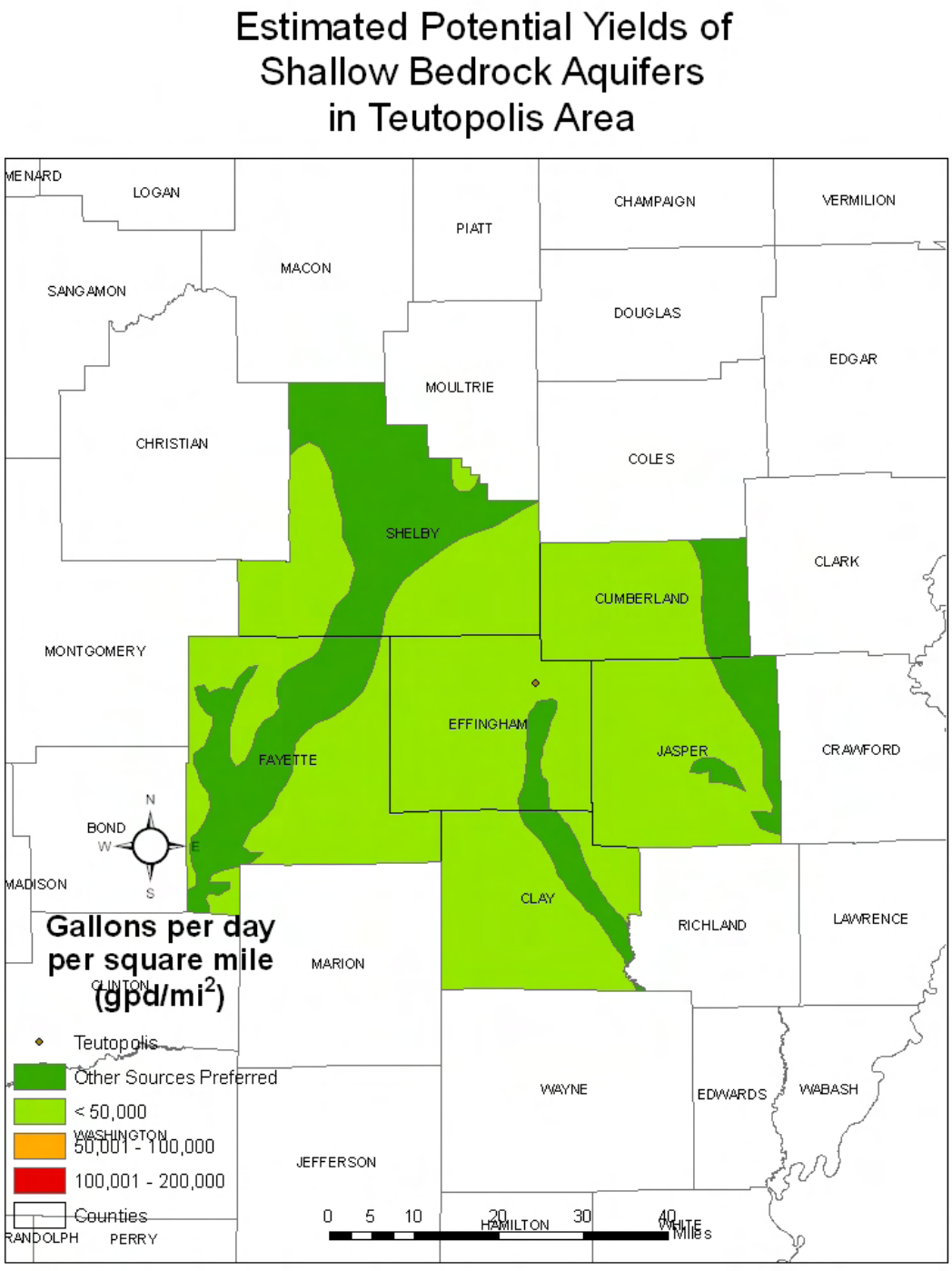

Estimated Potential Yields of
Shallow Bedrock Aquifers
in Teutopolis Area
MENARD
LOGAN
PIATT
CHAMPAIGN
VERMILION
MACON
SANGAMON
DOUGLAS
EDGAR
MOULTRIE
CHRISTIAN
COLES
SHELBY
CLARK
CUMBERLAND
MONTGOMERY
EFFINGHAM
JASPER
CRAWFORD
FAYETTE
BOND
N
W
E
S
MADISON
CLAY
RICHLAND
LAWRENCE
Gallons per day
per square mile
(gpd/mi2)
MARION
CLINTON
Teutopolis
Other Sources Preferred
< 50,000
50,001 - 100,000
100,001 - 200,000
Counties
WAYNE
EDWARDS
WABASH
WASHINGTON
JEFFERSON
0 5 10 20 30 40
Miles
HAMILTON
WHITE
RANDOLPH
PERRY

Figure 4.

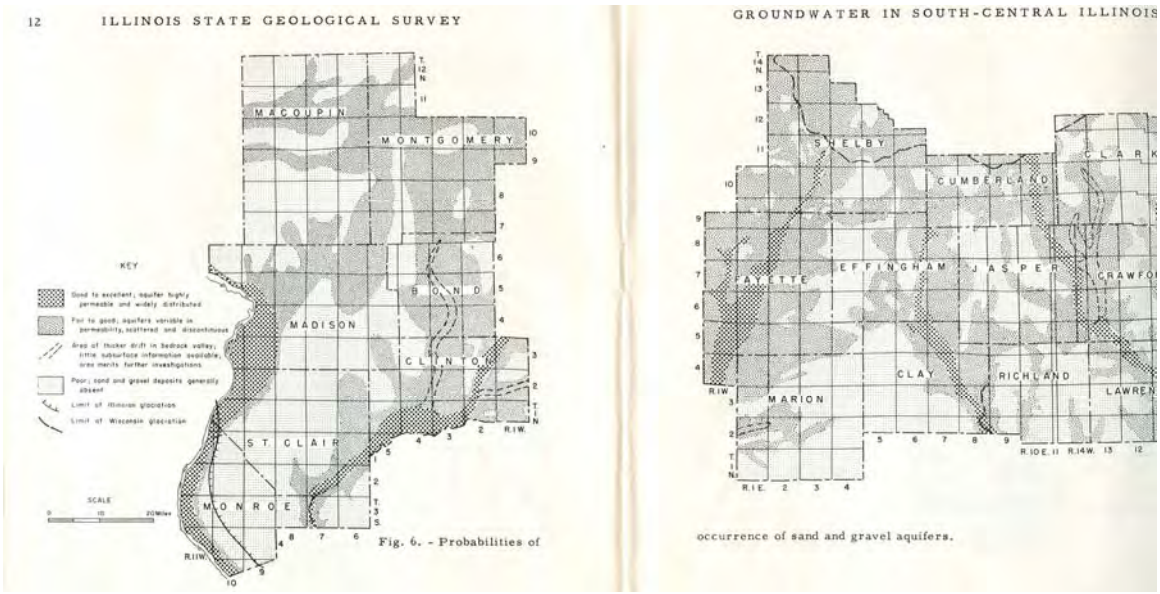


Figure 5.

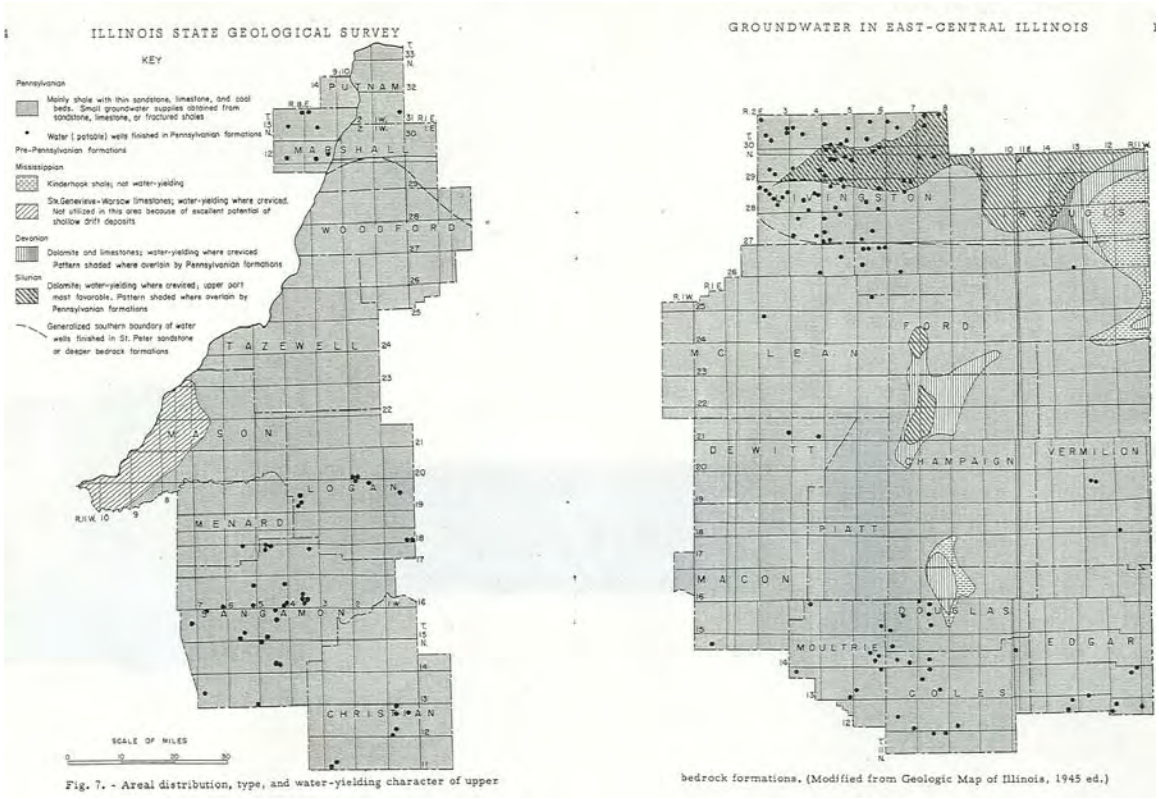


Figure 6.

References

Selkregg, L.F., W. Pryor, and J. Kempton. 1957. Groundwater Geology In South-Central Illinois, A preliminary Geologic Report. Illinois State Geological Survey Circular 225.

ISWS publications list for the Teutopolis and surrounding areas

(* indicates out of print)

CLAY

*1981	COOP-7	Procedures for the collection of representative water quality data from monitoring wells. Gibb-Schuller-Griffin. 66p.

CUMBERLAND

*1965	RI-53	Potential yield of aquifers in Embarras River Basin, Illinois. Walton-Csallany. Open File Report.
1965	RS-48	Relationship between water use and population in the Embarras River Basin, Illinois. Csallany.
*1978	CR-209	Assessment of public groundwater supplies in Illinois. Visocky-Wehrmann-Kim- Ringler. 193p.

EFFINGHAM

*1965	RI-53	Potential yield of aquifers in Embarras River Basin, Illinois. Walton-Csallany. Open File Report.
*1966	RI-55	Yields of wells in Pennsylvanian and Mississippian rocks in Illinois. Csallany. 42p.
1972	RI-70	Plans for meeting water requirements in the Kaskaskia River Basin, 1970-2020. Singh-Visocky-Lonnquist. 24p.
*1978	CR-209	Assessment of public groundwater supplies in Illinois. Visocky-Wehrmann- Kim-Ringler. 193p.
*1980	CR-237	Assessment of eighteen public groundwater supplies in Illinois. Wehrmann-Visocky-Burris-Ringler-Brower. 185p.

1992 COOP-14 Pilot Study: Agricultural chemicals in rural, private wells in Illinois. Schock-Mehnert-Caughey-Dreher-Dey-Wilson-Ray-Chou-Valkenburg-Gosar-Karny-Barnhardt-Black-Brown-Garcia. 84p.

1992 COOP-15 Characterization of the study areas for the Pilot Study: Agricultural chemicals in rural, private wells in Illinois. Barnhardt-Mehnert-Ray-Schock. 114p.

SHELBY

*1966 RI-55 Yields of wells in Pennsylvanian and Mississippian rocks in Illinois. Csallany. 42p.

1967 C-92 Groundwater availability in Shelby County, Illinois. Sanderson. 37p.

1997 CR611 Delination of Time-Related Recharge Areas for the City of Shelbyville Well Fields. Anliker-Roadcap. 69p.

1972 RI-70 Plans for meeting water requirements in the Kaskaskia River Basin, 1970-2020. Singh-Visocky-Lonnquist. 24p.

*1978 CR-209 Assessment of public groundwater supplies in Illinois. Visocky-Wehrmann-Kim- Ringler. 193p.

1982 COOP-8 Hydrogeologic evaluation of sand and gravel aquifers for municipal groundwater supplies in east-central Illinois. Kempton-Morse-Visocky. 59p.

*1982 CR-299 A summary of information related to the comprehensive management of groundwater and surface water resources in the Sangamon River Basin, Illinois. O'Hearn-Williams. 145p.

1997 CR-611 Delineation of time-related recharge areas for the city of Shelbyville well fields. Anliker-Roadcap. 69p.

FAYETTE

*1966 RI-55 Yields of wells in Pennsylvanian and Mississippian rocks in Illinois. Csallany. 42p.

1972 RI-70 Plans for meeting water requirements in the Kaskaskia River Basin, 1970-2020. Singh-Visocky-Lonnquist. 24p.

1989	ISSJR-2	Evaluation of underground injection of industrial waste in Illinois. Brower-Visocky-Krapac-Hensel-Peyton-Nealon-Guthrie. 182p.
1996	CR-592	Ground-Water Investigation in the Kaskaskia River Valley, Fayette County, Illinois. Sanderson. 131p.

JASPER

*1965	RI-53	Potential yield of aquifers in Embarras River Basin, Illinois. Walton-Csallany. Open File Report.
1965	RS-48	Relationship between water use and population in the Embarras River Basin, Illinois. Csallany.
*1966	RI-55	Yields of wells in Pennsylvanian and Mississippian rocks in Illinois. Csallany. 42p.
*1980	CR-237	Assessment of eighteen public groundwater supplies in Illinois. Wehrmann-Visocky-Burris-Ringler-Brower. 185p.
1998	CR-634	Ground-Water investigation in the Embarras River Valley, Jasper County, Illinois. Sanderson. 173p.